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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,654	11/15/2001	Hiroshi Tanaka	Q66556	7456

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EXAMINER	
SONG, HOON K	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/987,654	TANAKA ET AL.	
	Examiner	Art Unit	
	Hoon Song	2882	AU

-- The MAILING DATE of this communication appears on the cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,10,15,20-22,27,32 and 33* is/are allowed.

6)☒ Claim(s) *2,3,6-9,11-14,16-19,23-26,28-31 and 34-36* is/are rejected.

7)☒ Claim(s) *4 and 5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 6, 13, 18 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Watanabe et al. (US 6412978B1).

Regarding claim 6, Watanabe teaches a two dimensional radiation image detection device (51) capable of recording a radiation image equipment with an angular output means (82) that output an angular signal (column 5 line 38-40) which represents the degree of tilt of the radiation emitted from a radiation source in relation to the detection surface of said radiation image detection device (column 4 line 34-37 and column 9 line 58-60).

Regarding claim 13, Watanabe teaches that said image detection device comprises a stimulable phosphor sheet (column 4 line 2+).

Regarding claim 18, Watanabe teaches that said image detection device is located at a distance from a subject being imaged (figure 2).

Regarding claim 28, Watanabe teaches that said angular signal output means is an electronic level (figure 8).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7, 14, 19, 25-26 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al.

Regarding claim 7, Watanabe teaches a two dimensional radiation image detection device capable of recording a radiation image in relation to the detection surface of said radiation image detection device is substantially perpendicular.

However Watanabe fails to teach a command means that generates exposure command to the radiation source.

An x-ray exposure command means is well known in the art

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide system of Watanabe with a known x-ray exposure command means since the x-ray exposure command means would prevent x-ray over dosage and prevent image warps while exposing x-rays at the maintained perpendicular relation between the x-ray source and surface of the detector.

Regarding claim 14, Watanabe teaches that said image detection device comprises a stimulable phosphor sheet.

Regarding claim 19, Watanabe teaches that said image detection device is located at a distance from a subject being imaged (figure 2).

Regarding claim 25, Watanabe fails to teach a grid on the radiation image detection device.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to adapt well known anti-scatter grid on detector in order to prevent scattered radiation for better image.

Regarding claim 26, Watanabe fails to teach a scattering ray removal grid board adjacent to the radiation image detection device which prevents the occurrence of false images and enhances image reproducibility after radiation has been transmitted through a subject.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to adapt well known anti-scatter grid on detector in order to prevent scattered radiation for better image generation.

Regarding claim 29, Watanabe teaches that said angular signal output means is an electronic level (figure 8).

Claims 2-3, 8-9, 11-12, 16-17, 23-24, 30-31 and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. in view of Pattee (US 6142667).

Regarding claim 3, Watanabe teaches a radiation imaging system comprising:

a radiation source (50); and

a two dimensional radiation image detection device (51) that records a radiation image by detecting the radiation emitted from said radiation source and is transmitted through a subject;

a tilt of the radiation to be emitted from said radiation source in relation to the detection surface of said radiation image detection device is substantially perpendicular.

Watanabe fails to teach a command means.

A command means for generating x-ray exposure command is known in the art.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide system of Watanabe with a known x-ray exposure command means since the x-ray exposure command means would prevent x-ray over dosage and prevent image warps while exposing x-rays at the maintained perpendicular relation between the x-ray source and surface of the detector.

Watanabe fails to teach that the system is portable

Pattee teaches a C-arm x-ray imaging system having wheels.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to make movable C-arm x-ray imaging system in order to take x-ray image at any convenience location for patient and x-ray taking personnel. Accordingly, mobility of the system would be improved.

Regarding claim 12, Watanabe teaches that said image detection device comprises a stimulable phosphor sheet (column 4 line 2+).

Regarding claim 17, Watanabe teaches that said image detection device is located at a distance from a subject being imaged (figure 2).

Regarding claim 24, Watanabe fails to teach a scattering ray removal grid board adjacent to the radiation image detection device which prevents the occurrence of false images and enhances image reproducibility after radiation has been transmitted through a subject.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to adapt well known anti-scatter grid on detector in order to prevent scattered radiation for better image.

Regarding claim 35, Watanabe teaches an angular signal output means that ouputs an angular signal which represents the degree of tilt of the radiation emitted from said radiation source in relation to the detection surface of said radiation image detection device.

Regarding claim 36, Watanabe teaches that said angular signal output means is an electronic level or a projection style angle sensor.

Regarding claim 8, Watanabe fails to teach said device is portable.

Pattee teaches a C-arm x-ray imaging system having wheels.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to make movable C-arm x-ray imaging system in order to take x-ray image at any convenience location for patient and x-ray taking personnel. Accordingly, mobility of the system would be improved.

Regarding claim 30, Watanabe fails to teach that the system is carriable.

Pattee teaches a C-arm x-ray imaging system having wheels.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to make movable C-arm x-ray imaging system in order to take x-ray image at any convenience location for patient and x-ray taking personnel. Accordingly, mobility of the system would be improved.

Regarding claim 2, Watanabe teaches a radiation imaging system comprising:

a radiation source (50); and

a two dimensional radiation image detection device (51) that records a radiation image by detecting the radiation emitted from said radiation source and is transmitted through a subject; further comprising:

an angular signal output means (82) that outputs an angular signal which represents the degree of tilt of the radiation emitted from said radiation source in relation to the detection surface of said radiation image detection device (column 5 line 38-40); and

a tilt adjustment means (86, detector positioning controller with actuators) that adjusts said tilt of the radiation in relation to the detection surface of the radiation image detection device to become substantially perpendicular by changing the tilt angle of said radiation image detection device based on said angular signal output from said angular signal output means (column 4 line 34-37 and column 9 line 58-60).

However Watanabe fails to teach that the system is carriable.

Pattee teaches a C-arm x-ray imaging system having wheels.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to make movable C-arm x-ray imaging system in order to take x-ray

image at any convenience location for patient and x-ray taking personnel. Accordingly, mobility of the system would be improved.

Regarding claim 16, Watanabe teaches that said image detection device is located at a distance from a subject being imaged (figure 2).

Regarding claim 11, Watanabe teaches that said image detection device comprises a stimulate phosphor sheet (column 4 line 2+).

Regarding claim 23, Watanabe fails to teach a grid on the radiation image detection device.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to adapt well known anti-scatter grid on detector in order to prevent scattered radiation for better image.

Allowable Subject Matter

Claims 1, 4-5, 10, 15, 20-22, 27 and 32-33 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: None of the prior art teaches or suggests a tilt adjustment means that adjusts a tile of a radiation in relation to a detection surface of a radiation image detection device to become substantially perpendicular by changing a tilt angle of a radiation source based on said angular signal output from said angular signal output means as claimed in independent claim 1.

Claims 4-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

None of the prior art teaches or suggests a portable shift means that enables horizontal movement of the radiation source as claimed in dependent claim 4.

None of the prior art teaches or suggests a portable shift means that enables horizontal movement of the radiation image detection device as claimed in dependent claim 5.

Response to Arguments

Applicant's arguments with respect to claims 1-33 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is 703-308-2736. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on 703-308-4858. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Hoon Song

5/31/04
HS

Craig E. Church
Primary Examiner